



August 8, 2001

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**Memo To:** Doug Wheeler  
GWF Power Systems Company

**From:** David Deckman

**Subject:** Interpollutant Offset Ratio Analysis for GWF Henrietta Project

As you requested, attached is an analysis of the interpollutant offset ratio for using sulfur oxides (SO<sub>x</sub>) Emission Reduction Credits to offset emissions of respirable particulate matter (PM<sub>10</sub>). GWF Energy LLC is proposing to use SO<sub>x</sub> ERCS, which were generated from the shutdown of a facility in Hanford, to offset PM<sub>10</sub> from the proposed Henrietta Peaker Plant (HPP). The distance between the source of the ERCS and the proposed power plant project is 16.2 miles. Our analysis indicates that the appropriate interpollutant ratio is 1.4 to 1.0, and that the overall offset ratio, including the adjustment for distance between the proposed project and the source of the ERCS, would be 1.9 to 1.0. This analysis is consistent with those approved by the San Joaquin Valley Unified Air Pollution Control District for other projects.

Please be aware that Section 4.2.5.3 of SJVUAPCD Rule 2201 (New and Modified Stationary Source Review) allows the use of interpollutant offsets only if the project will not cause violations of the ambient air quality standards. Because ambient PM<sub>10</sub> concentrations in the San Joaquin Valley currently exceed the state and federal standards, the SJVUAPCD is accepting a demonstration that the project would not cause PM<sub>10</sub> ambient concentrations in excess of the significance criteria in Title 40 Code of Federal Regulations Part 51.165(b)(2). These thresholds are 5 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) and 1.0  $\mu\text{g}/\text{m}^3$  for the 24-hour and annual averaging periods, respectively. The air quality impact analysis and modeling will be prepared and submitted as part of the Application for Certification for this project.

If you have any questions regarding this analysis, please feel free to contact us.

attachment

**INTERPOLLUTANT OFFSET RATIO ANALYSIS  
FOR THE  
GWF ENERGY LLC HENRIETTA PEAKER PLANT**

GWF Energy LLC (GWF) proposes to use sulfur oxides (SOx) Emission Reduction Credits (ERCs) to offset emissions of respirable particulate matter (PM<sub>10</sub>) from its proposed Henrietta Peaker Plant in Kings County, California. The SOx ERCs will supplement PM<sub>10</sub> ERCs from Certificate No. C-366-4. GWF also owns SOx ERC Certificate Nos. N-414-5 and N-415-5. The two SOx ERC certificates were issued by the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) for emission reductions that were originally generated by the shutdown of a facility located at 525 West Third Street in Hanford, California. SJVUAPCD Rule 2201, Section 4.2.5.3 provides:

*Interpollutant offsets may be approved by the APCO on a case-by-case basis, provided that the applicant demonstrates to the satisfaction of the APCO, in accordance with the provisions of Section 4.3.2 of this rule, that the emission increases from the new or modified source will not cause or contribute to a violation of an ambient air quality standard. In such cases, the APCO shall, based on an air quality analysis, impose offset ratios equal to or greater than the requirements, of this rule.*

GWF will provide a demonstration that the emission increases associated with the project will not cause or contribute to a violation of an ambient air quality standard. This analysis does not address those impacts.

This analysis provides a technical rationale for an appropriate SOx-to-PM<sub>10</sub> interpollutant ratio, as well as the overall offset ratio to reflect the distance between the source providing the offsets and the proposed project.

### Interpollutant Ratio

To develop an interpollutant offset ratio for SOx and PM<sub>10</sub>, this analysis uses (1) a speciated linear rollback analysis using ambient monitoring data from Kings County, in which both the proposed GWF project and the ERC source are located; (2) emission inventory data in Kings County; and (3) the results of Chemical Mass Balance (CMB) modeling at a location in Kings County. The approach is based on a simple box model that ignores transport and deposition; assumes that the box is the size of Kings County; and assumes that the ambient pollutant concentrations in the box (Kings County) can be represented by the values reported for the South Irwin Street monitoring station in Hanford and the Patterson Avenue and Van Dorsten Avenue monitoring stations in Corcoran. These are the only monitoring stations in Kings County that have the data required for this analysis. The interpollutant ratio calculations described below are shown in Attachment 1.

The actual, annual average nitrate, sulfate, chloride, and total PM<sub>10</sub> ambient air measurements were used to partially speciate the PM<sub>10</sub>. The ambient monitoring data were reported by the Air Resources Board (ARB) for monitoring stations located on South Irwin Street in Hanford and on Patterson Avenue and Van Dorsten Avenue in Corcoran for 1997 and 1998, the most recent years for which the speciated PM<sub>10</sub> were available. According to ARB staff, speciation of the PM<sub>10</sub> samples was discontinued at these monitoring stations at the end of 1998.

The unspeciated balance of the PM<sub>10</sub> (after subtracting the ammonium sulfate, ammonium nitrate, and ammonium chloride from total PM<sub>10</sub>) is split between direct-combustion-related PM<sub>10</sub> (fuel combustion and mobile sources) and other direct PM<sub>10</sub> sources. The contribution from direct-combustion-related PM<sub>10</sub> is based on Chemical Mass Balance (CMB) modeling performed for the District's PM<sub>10</sub> Attainment Demonstration Plan. CMB modeling was conducted by the ARB for several locations within the San Joaquin Valley for annual average conditions in support of the District's attainment plan. Annual analyses were performed for locations in Bakersfield, Corcoran, Fresno, and Visalia. The nearest modeled site to the proposed GWF project is Corcoran. The CMB modeling evaluated the contribution of specific source categories. The "mobile" category represents the contribution from mobile and other combustion sources, such as those proposed for the GWF project. In this case, the CMB modeling for the Corcoran location found that the mobile category contributed 5.39 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) out of the total annual average PM<sub>10</sub> concentration of 59  $\mu\text{g}/\text{m}^3$  for 1993. A table from the attainment plan showing these values is attached (see Attachment 2). Thus, the direct-combustion contribution was assumed to be 9.1 percent (i.e., 5.39/59).

Next, since direct PM<sub>10</sub> emissions from combustion sources (gas turbines) are being offset, it was determined how many  $\mu\text{g}/\text{m}^3$  of ambient PM<sub>10</sub> are associated with 1 ton/year of direct combustion PM<sub>10</sub> emissions by dividing the annual average direct-combustion PM<sub>10</sub> concentration by the total annual PM<sub>10</sub> emissions in Kings County. A similar calculation was performed for sulfur dioxide by dividing the annual average sulfate concentration by the annual SO<sub>2</sub> emissions in Kings County. The inventory data were obtained from the ARB website (<http://www.arb.ca.gov/app/emsinv/emssumcat.php>). The daily values from this inventory were multiplied by 365 to compute the annual values. Total PM<sub>10</sub> and SO<sub>x</sub> inventories were calculated for the years considered in this analysis. Inventory data were available from the ARB website for 1996 and 1998, but not for 1997. The 1997 inventory was computed by interpolating between 1996 and 1997. The inventory data for Kings County are shown in Attachment 3. The ratio of the  $\mu\text{g}/\text{m}^3$  per ton/year values indicates the number of tons of sulfur dioxide emissions that it takes to create the same number of  $\mu\text{g}/\text{m}^3$  of PM<sub>10</sub> that would be created by 1 ton/year of direct-combustion PM<sub>10</sub> emissions. As shown in Attachment 1, this calculation results in interpollutant offset ratios of 1.17 to 1 and 1.64 to 1 for the two years evaluated, or an average of 1.4 to 1. The results were relatively consistent between the three monitoring stations for each year, and differ slightly between the two calendar years of data on which these analyses were based.

## Offset Ratio

Rule 2201 does not indicate specifically how the interpollutant ratio (described above) and the distance ratio (pursuant to Section 4.2.4 of Rule 2201) should be applied. Leonard Scandura of the District's Southern Region office provided a description of how the District computes the overall offset ratio. The methodology provided by Mr. Scandura addresses sources of NOx offsets within 15 miles of the new source and more than

15 miles from the new source. Because the ERC source in this case is more than 15 miles from the GWF facility and is providing SOx ERCs, this description has been modified to address only this case. The methodology provided by Mr. Scandura is as follows (with revisions to reflect the distance relationship, transfer of SOx ERCs, and a 1.4 to 1 interpollutant offset ratio):

*Rule 2201 includes provisions for including distance offset ratios and interpollutant offset ratios to determine the quantity of offsets required. These two offset ratios are applied independently to determine the quantity of offset required.*

*The distance ratio specifies the excess amount of offsets required due to the distance between the increase in emissions and the location at which the emission reductions occurred. For example, if the distance offset ratio is 1.5:1, 100% of the fraction of the emission increase to be offset at this distance is required plus an additional 50% to account for the distance between the increase in emissions and the location of the emissions reductions.*

*The interpollutant offset ratio specifies excess amount of offsets required when the emission increases and the offsets being provided are not the same pollutant. Specifically, the interpollutant offset ratio quantifies the relationship between the pollutant being emitted and the emission reductions being provided. In this case [the analysis described in this report], the interpollutant offset ratio is 1.4:1, i.e., 100% of the emission increase is required to be offset plus an additional 40% to account for the relationship between the pollutant being emitted and the emissions reduction.*

*When both the distance and interpollutant offset ratios apply, the overall offset quantity required is equal to the sum of the amount being emitted and the excess amount(s) required due to the distance offset ratio plus the excess amount due to the interpollutant offset ratio. The computation of the resulting overall SOx for PM<sub>10</sub> offset ratio is as follows:*

$$\begin{aligned} \text{SOx req'd ton/year} &= \text{PM}_{10} \text{ ton/year} + \text{PM}_{10} \text{ ton/year to be offset by SOx} \\ &\quad \text{ERCs } > 15 \text{ miles away} * 0.5 + \text{PM}_{10} \text{ ton/year to be offset} \\ &\quad \text{by SOx reductions} * 0.4 \end{aligned}$$

$$\text{SOx req'd ton/year} = \text{PM}_{10} \text{ ton/year} + \text{PM}_{10} \text{ ton/year (0.5)} + \text{PM}_{10} \text{ ton/year (0.4)}$$

$$\text{SOx req'd ton/year} = \text{PM}_{10} \text{ ton/year (1 + 0.5 + 0.4)}$$

*Thus, the combined distance and interpollutant ratio is:*

$$SOx/PM10 = 1 + 0.5 + 0.4$$

Using this methodology, the overall distance and interpollutant offset ratio is as follows:

$$SOx/PM_{10} = 1 + 0.5 + 0.4 = 1.9$$

ATTACHMENT 1

INTERPOLLUTANT OFFSET RATIO  
CALCULATIONS

**GWF - Henrietta Peaker Plant**  
**PM10 Interpollutant Offset Ratio Analysis**

07-Aug-01

**1997 Annual Average Concentrations (AAM)**

Station	Total PM10 ug/m3	PM10 Nitrate ug/m3	PM10 Sulfate ug/m3	PM10 Chloride ug/m3
Hanford - So Irwin St	46.5	5.42	1.79	0.046
Corcoran - Patterson	48.1	4.89	1.66	0.061
Corcoran - VanDorsten	44.8	5.24	1.62	0.052
Ion Form		NO3	SO4	Cl
Ion Molecular Weight		62.005	96.062	35.453
Combined Form		NH4NO3	(NH4)2SO4	NH4Cl
Combined Molecular Wt		80.043	132.139	53.492

Direct Combustion PM10 fraction of total ambient PM10 (source apportionment): 9.1%

Station	Total PM10 ug/m3	PM10 NH4NO3 ug/m3	PM10 (NH4)2SO4 ug/m3	PM10 NH4Cl ug/m3	PM10 Direct Combustion ug/m3	PM10 Other ug/m3
Hanford - So Irwin St	46.5	7.00	2.46	0.07	4.23	32.74
Corcoran - Patterson	48.1	6.31	2.28	0.09	4.38	35.03
Corcoran - VanDorsten	44.8	6.76	2.23	0.08	4.08	31.65

**1997 Annual Emissions (tons/year) - Kings County**

Total PM10	NOx	SOx	Combustion PM10	Other Direct PM10
13,291	9,769	529	588	12,704

	Hanford So Irwin St	Corcoran Patterson	Corcoran VanDorsten
Direct Combustion PM10:			
588 tons/yr =	4.23	4.38	4.08
1 ton/yr =	0.00720	0.00745	0.00694

SO2 -> Sulfates:	Hanford So Irwin St	Corcoran Patterson	Corcoran VanDorsten
529 tons/yr =	2.46	2.28	2.23
1 ton/yr =	0.00465	0.00431	0.00421

SO2:PM10 ratio =	Average
	1.64

**GWF - Henrietta Peaker Plant**  
**PM10 Interpollutant Offset Ratio Analysis**

07-Aug-01

**1998 Annual Average Concentrations (AAM)**

Station	Total PM10 ug/m3	PM10 Nitrate ug/m3	PM10 Sulfate ug/m3	PM10 Chloride ug/m3
Hanford - So Irwin St	38.9	3.33	2.00	0.028
Corcoran - Patterson	38.2	4.08	1.86	0.031
Corcoran - VanDorsten	29.0	1.30	1.74	0.027
Ion Form		NO3	SO4	Cl
Ion Molecular Weight		62.005	96.062	35.453
Combined Form		NH4NO3	(NH4)2SO4	NH4Cl
Combined Molecular Wt		80.043	132.139	53.492

Direct Combustion PM10 fraction of total ambient PM10 (source apportionment): 9.1%

Station	Total PM10 ug/m3	PM10 NH4NO3 ug/m3	PM10 (NH4)2SO4 ug/m3	PM10 NH4Cl ug/m3	PM10 Direct Combustion ug/m3	PM10 Other ug/m3
Hanford - So Irwin St	38.9	4.30	2.75	0.04	3.54	28.27
Corcoran - Patterson	38.2	5.27	2.56	0.05	3.48	26.85
Corcoran - VanDorsten	29.0	1.68	2.39	0.04	2.64	22.25

**1998 Annual Emissions (tons/year) - Kings County**

	Total PM10	NOx	SOx	Combustion PM10	Other Direct PM10
	13,363	9,815	533	569	12,793

	Hanford So Irwin St	Corcoran Patterson	Corcoran VanDorsten
Direct Combustion PM10:			
569 tons/yr =	3.54	3.48	2.64
1 ton/yr =	0.00622	0.00611	0.00463

	Hanford So Irwin St	Corcoran Patterson	Corcoran VanDorsten
SO2 -> Sulfates:			
533 tons/yr =	2.75	2.56	2.39
1 ton/yr =	0.00516	0.00480	0.004491

	Average
SO2:PM10 ratio =	1.20

ATTACHMENT 2  
CMB MODELING RESULTS FOR CORCORAN

## CORCORAN Annual

CORCORAN		Geologic	Construction	Mobile	Organic Carbon	Vegetative Burning	Ammonium Nitrate	Associated Water	Ammonium Sulfate	Unassigned	Marine
<b>TOTAL</b>		32.44	0.35	5.39	0.00	0.70	7.41	2.00	2.32	8.09	0.30
<b>CMB Annual</b>		59.00	0.59%	9.13%	0.00%	1.19%	12.56%	3.39%	3.93%	13.71%	0.52%
<b>CMB Percents</b>		54.98%									
<b>Adjusted Concentrations</b>		52.00	28.59	0.31	4.75	0.00	0.62	6.53	1.76	2.04	7.13
<b>Natural Background %</b>		5%	0%	0%	0%	0%	0%	0%	0%	10%	100%
<b>Natural Background Value</b>		2.41	1.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.71
<b>Local Contribution (Adjusted Concentration - Background)</b>		49.59	27.16	0.31	4.75	0.00	0.62	6.53	1.76	2.04	6.42
<b>Ammonia Emission Estimate (%)</b>											
<b>Ammonia Emission Estimate (ug/m3)</b>		0.98									
<b>Local Contribution (Without Ammonia)</b>		48.61	27.16	0.31	4.75	0.00	0.62	5.55	1.76	2.04	6.42
<b>Base Year 1993 Emission Inventory</b>											457.80
<b>PM10</b>		457.80	378.22	18.45	16.54	36.82					
<b>ROG</b>		538.87			538.87						
<b>NOx</b>		576.14					576.14	576.14			
<b>SOx</b>		34.88								34.88	
<b>Future Year Emission Inventory 2001</b>		PM	435.27	340.93	14.80	9.98	58.05				435.27
<b>ROG</b>		387.58			387.58						
<b>NOx</b>		458.87					458.87	458.87			
<b>SOx</b>		33.70								33.70	
<b>E/EB Ratio for Local Rollback Projection</b>		0.01	0.90	0.00	0.00	0.72	1.52	0.79	0.79	0.95	1.00
<b>Projected Local</b>		42.39	24.48	0.25	2.86	0.00	0.94	4.39	1.39	1.97	6.10
<b>Natural Background</b>		2.41	1.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.71
<b>Ammonia Emission Estimate</b>		0.98	25.91	0.25	2.86	0.00	0.94	5.37	1.39	1.97	6.81
<b>2001 Projected Annual (Result)</b>		45.78									
<b>Future Year Emission Inventory 2008</b>		PM	448.21	348.57	16.28	9.71	58.28				448.21
<b>ROG</b>		328.21			328.21						
<b>NOx</b>		402.85					402.85	402.85			
<b>SOx</b>		35.15							35.15		
<b>E/EB Ratio for Local Rollback Projection</b>		0.75	0.92	0.88	0.59	0.61	1.58	0.70	0.70	1.01	0.97
<b>Projected Local</b>		42.48	25.03	0.27	2.79	0.00	0.98	3.87	1.23	2.06	6.25
<b>Natural Background</b>		2.41	1.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.71
<b>Ammonia Emission Estimate</b>		0.98									
<b>2008 Projected Annual (Result)</b>		45.87	28.46	0.27	2.79	0.00	0.98	4.85	1.23	2.06	6.97

ATTACHMENT 3

EMISSIONS INVENTORY  
FOR  
KINGS COUNTY

**1997 EMISSION INVENTORY FOR KINGS COUNTY**

CATEGORY	SUBCATEGORY	EMISSIONS (TONS PER DAY)				PM	PM10
		CO	NOX	SOX	TG		
FUEL COMBUSTION	ELECTRIC UTILITIES	0.00	0.00	0.00	0.00	0.00	0.00
FUEL COMBUSTION	COGENERATION	0.02	0.00	0.07	0.08	0.19	0.02
FUEL COMBUSTION	OIL AND GAS PRODUCTION (COMBUSTION)	0.21	0.02	0.08	0.54	0.01	0.01
FUEL COMBUSTION	PETROLEUM REFINING (COMBUSTION)	0.00	0.00	0.00	0.00	0.00	0.00
FUEL COMBUSTION	MANUFACTURING AND INDUSTRIAL	0.04	0.01	0.63	5.24	0.22	0.11
FUEL COMBUSTION	FOOD AND AGRICULTURAL PROCESSING	0.21	0.18	1.11	3.68	0.33	0.37
FUEL COMBUSTION	SERVICE AND COMMERCIAL	0.03	0.02	0.30	1.32	0.03	0.04
FUEL COMBUSTION	OTHER (FUEL COMBUSTION)	0.00	0.00	0.00	0.00	0.00	0.00
WASTE DISPOSAL	SEWAGE TREATMENT	0.00	0.00	0.00	0.00	0.00	0.00
WASTE DISPOSAL	LANDFILLS	0.03	0.02	0.00	0.00	0.00	0.00
WASTE DISPOSAL	INCINERATORS	0.00	0.00	0.00	0.00	0.00	0.00
WASTE DISPOSAL	SOIL REMEDIATION	0.02	0.01	0.00	0.00	0.00	0.00
WASTE DISPOSAL	OTHER (WASTE DISPOSAL)	2.18	1.06	0.00	0.00	0.00	0.00
CLEANING AND SURFACE COATINGS	LAUNDERING	0.02	0.00	0.00	0.00	0.00	0.00
CLEANING AND SURFACE COATINGS	DEGREASING	0.31	0.28	0.00	0.00	0.00	0.00
CLEANING AND SURFACE COATINGS	COATINGS AND RELATED PROCESS SOLVENTS	0.42	0.39	0.00	0.00	0.00	0.00
CLEANING AND SURFACE COATINGS	PRINTING	0.03	0.03	0.00	0.00	0.00	0.00
CLEANING AND SURFACE COATINGS	ADHESIVES AND SEALANTS	0.06	0.05	0.00	0.00	0.00	0.00
CLEANING AND SURFACE COATINGS	OTHER (CLEANING AND SURFACE COATINGS)	0.02	0.00	0.00	0.00	0.00	0.00
PETROLEUM PRODUCTION AND MARKETING	OIL AND GAS PRODUCTION	0.73	0.41	0.00	0.01	0.00	0.00
PETROLEUM PRODUCTION AND MARKETING	PETROLEUM REFINING	0.00	0.00	0.00	0.00	0.00	0.00
PETROLEUM PRODUCTION AND MARKETING	PETROLEUM MARKETING	0.18	0.17	0.00	0.00	0.00	0.00
PETROLEUM PRODUCTION AND MARKETING	OTHER (PETROLEUM PRODUCTION AND MARKETING)	0.15	0.13	0.00	0.00	0.00	0.00
INDUSTRIAL PROCESSES	CHEMICAL	1.24	0.75	0.00	0.00	0.00	0.00
INDUSTRIAL PROCESSES	FOOD AND AGRICULTURE	0.00	0.00	0.00	0.00	0.00	0.00
INDUSTRIAL PROCESSES	MINERAL PROCESSES	0.00	0.00	0.00	0.00	0.13	0.08
INDUSTRIAL PROCESSES	METAL PROCESSES	0.00	0.00	0.00	0.00	0.00	0.00
INDUSTRIAL PROCESSES	WOOD AND PAPER	0.00	0.00	0.00	0.00	0.01	0.01
INDUSTRIAL PROCESSES	GLASS AND RELATED PRODUCTS	0.00	0.00	0.00	0.00	0.00	0.00
INDUSTRIAL PROCESSES	ELECTRONICS	0.00	0.00	0.00	0.00	0.00	0.00
INDUSTRIAL PROCESSES	OTHER (INDUSTRIAL PROCESSES)	0.00	0.00	0.00	0.00	0.01	0.01
SOLVENT EVAPORATION	CONSUMER PRODUCTS	1.20	0.99	0.00	0.00	0.00	0.00
SOLVENT EVAPORATION	ARCHITECTURAL COATINGS AND RELATED PROCESS SOLVENTS	0.44	0.42	0.00	0.00	0.00	0.00
SOLVENT EVAPORATION	PESTICIDES/FERTILIZERS	2.65	2.65	0.00	0.00	0.00	0.00
SOLVENT EVAPORATION	ASPHALT PAVING / ROOFING	0.08	0.07	0.00	0.00	0.00	0.00
SOLVENT EVAPORATION	REFRIGERANTS	0.00	0.00	0.00	0.00	0.00	0.00
SOLVENT EVAPORATION	OTHER (SOLVENT EVAPORATION)	0.00	0.00	0.00	0.00	0.00	0.00
MISCELLANEOUS PROCESSES	RESIDENTIAL FUEL COMBUSTION	0.31	0.13	1.77	0.09	0.30	0.28
MISCELLANEOUS PROCESSES	FARMING OPERATIONS	93.93	7.51	0.00	0.00	27.84	12.66
MISCELLANEOUS PROCESSES	CONSTRUCTION AND DEMOLITION	0.00	0.00	0.00	0.00	1.80	0.88
MISCELLANEOUS PROCESSES	PAVED ROAD DUST	0.00	0.00	0.00	0.00	4.18	1.91
MISCELLANEOUS PROCESSES	UNPAVED ROAD DUST	0.00	0.00	0.00	0.00	12.90	7.67
MISCELLANEOUS PROCESSES	FUGITIVE WINDBLOWN DUST	0.00	0.00	0.00	0.00	17.37	7.91
MISCELLANEOUS PROCESSES	FIRES	0.01	0.00	0.05	0.00	0.01	0.01
MISCELLANEOUS PROCESSES	WASTE BURNING AND DISPOSAL	2.94	1.68	18.64	0.18	2.70	2.65
MISCELLANEOUS PROCESSES	UTILITY EQUIPMENT	0.00	0.00	0.00	0.00	0.00	0.00
MISCELLANEOUS PROCESSES	COOKING	0.02	0.02	0.00	0.00	0.07	0.05

**1997 EMISSION INVENTORY FOR KINGS COUNTY**

CATEGORY	SUBCATEGORY	EMISSIONS (TONS PER DAY)			
		TOG	CO	NOX	SOX
MISCELLANEOUS PROCESSES	OTHER (MISCELLANEOUS PROCESSES)	0.00	0.00	0.00	0.00
ON-ROAD MOTOR VEHICLES	LIGHT DUTY PASSENGER (LDA)	3.93	3.58	30.85	2.47
ON-ROAD MOTOR VEHICLES	LIGHT AND MEDIUM DUTY TRUCKS	0.00	0.00	0.00	0.00
ON-ROAD MOTOR VEHICLES	LIGHT DUTY TRUCKS - 1 (LDT1)	1.31	1.20	12.95	0.92
ON-ROAD MOTOR VEHICLES	LIGHT DUTY TRUCKS - 2 (LDT2)	0.95	0.85	9.90	1.22
ON-ROAD MOTOR VEHICLES	MEDIUM DUTY TRUCKS (MDV)	0.99	0.90	10.39	0.91
ON-ROAD MOTOR VEHICLES	HEAVY DUTY GAS TRUCKS (ALL)	0.00	0.00	0.00	0.00
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY GAS TRUCKS - 1 (LHDV1)	0.61	0.56	9.41	0.40
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY GAS TRUCKS - 2 (LHDV2)	0.03	0.02	0.30	0.05
ON-ROAD MOTOR VEHICLES	MEDIUM HEAVY DUTY GAS TRUCKS (MHDV)	0.45	0.41	7.86	0.25
ON-ROAD MOTOR VEHICLES	HEAVY HEAVY DUTY GAS TRUCKS (HHDV)	0.21	0.19	3.86	0.09
ON-ROAD MOTOR VEHICLES	HEAVY DUTY DIESEL TRUCKS (ALL)	0.00	0.00	0.00	0.00
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.00	0.00	0.01	0.00
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY DIESEL TRUCKS - 2 (LHDV2)	0.04	0.03	0.23	0.65
ON-ROAD MOTOR VEHICLES	MEDIUM HEAVY DUTY DIESEL TRUCKS (MHDV)	0.30	0.26	1.27	2.49
ON-ROAD MOTOR VEHICLES	HEAVY HEAVY DUTY DIESEL TRUCKS (HHDV)	0.11	0.10	0.42	0.02
ON-ROAD MOTOR VEHICLES	MOTORCYCLES (MCY)	0.01	0.01	0.03	0.11
ON-ROAD MOTOR VEHICLES	HEAVY DUTY DIESEL URBAN BUSES (UB)	0.00	0.00	0.10	0.00
ON-ROAD MOTOR VEHICLES	HEAVY DUTY GAS URBAN BUSES (UB)	0.03	0.02	0.57	0.10
ON-ROAD MOTOR VEHICLES	SCHOOL BUSES (SB)	0.03	0.03	0.48	0.07
ON-ROAD MOTOR VEHICLES	MOTOR HOMES (MH)	0.00	0.00	0.00	0.00
ON-ROAD MOTOR VEHICLES	OTHER (ON-ROAD MOTOR VEHICLES)	0.00	0.00	0.00	0.00
ON-ROAD MOTOR VEHICLES	AIRCRAFT	3.84	3.42	7.88	0.96
ON-ROAD MOTOR VEHICLES	TRAINS	0.01	0.01	0.03	0.24
ON-ROAD MOTOR VEHICLES	SHIPS AND COMMERCIAL BOATS	0.00	0.00	0.00	0.00
ON-ROAD MOTOR VEHICLES	RECREATIONAL BOATS	0.05	0.05	0.16	0.00
ON-ROAD MOTOR VEHICLES	OFF-ROAD RECREATIONAL VEHICLES	0.12	0.11	0.71	0.01
ON-ROAD MOTOR VEHICLES	OFF-ROAD EQUIPMENT	0.36	0.31	3.36	0.90
ON-ROAD MOTOR VEHICLES	FARM EQUIPMENT	0.56	0.50	3.32	3.74
ON-ROAD MOTOR VEHICLES	FUEL STORAGE AND HANDLING	0.00	0.00	0.00	0.00
ON-ROAD MOTOR VEHICLES	OTHER (OTHER MOBILE SOURCES)	0.00	0.00	0.00	0.00
OTHER MOBILE SOURCES	GEOGENIC SOURCES	0.01	0.01	0.00	0.00
OTHER MOBILE SOURCES	WILDFIRES	0.00	0.00	0.00	0.00
OTHER MOBILE SOURCES	WINDBLOWN DUST	0.00	0.00	0.00	0.00
OTHER MOBILE SOURCES	OTHER (NATURAL SOURCES)	0.00	0.00	0.00	0.00
ALL SOURCES		121.33	29.49	126.67	26.77
					1.45
					70.47

PM10 - FUEL COMBUSTION  
 PM10 - MOBILE SOURCES  
 PM10 - ALL SOURCES

0.78  
 0.83  
 36.42

**1998 EMISSION INVENTORY FOR KINGS COUNTY**

CATEGORY	SUBCATEGORY	EMISSIONS (TONS PER DAY)				PM10
		TOG	ROG	CO	NOX	
FUEL COMBUSTION	ELECTRIC UTILITIES	0.00	0.00	0.00	0.00	0.00
FUEL COMBUSTION	COGENERATION	0.02	0.00	0.06	0.07	0.02
FUEL COMBUSTION	OIL AND GAS PRODUCTION (COMBUSTION)	0.24	0.02	0.09	0.63	0.01
FUEL COMBUSTION	PETROLEUM REFINING (COMBUSTION)	0.00	0.00	0.00	0.00	0.00
FUEL COMBUSTION	MANUFACTURING AND INDUSTRIAL	0.03	0.02	0.64	5.38	0.10
FUEL COMBUSTION	FOOD AND AGRICULTURAL PROCESSING	0.21	0.18	1.08	3.67	0.39
FUEL COMBUSTION	SERVICE AND COMMERCIAL	0.02	0.02	0.42	1.72	0.03
FUEL COMBUSTION	OTHER (FUEL COMBUSTION)	0.00	0.00	0.00	0.00	0.00
FUEL COMBUSTION	SEWAGE TREATMENT	0.00	0.00	0.00	0.00	0.00
WASTE DISPOSAL	LANDFILLS	0.06	0.04	0.00	0.00	0.00
WASTE DISPOSAL	INCINERATORS	0.00	0.00	0.00	0.00	0.00
WASTE DISPOSAL	SOIL REMEDIATION	0.00	0.00	0.00	0.00	0.00
WASTE DISPOSAL	OTHER (WASTE DISPOSAL)	2.11	1.01	0.00	0.00	0.00
CLEANING AND SURFACE COATINGS	LAUNDERING	0.02	0.00	0.00	0.00	0.00
CLEANING AND SURFACE COATINGS	DEGREASING	0.32	0.29	0.00	0.00	0.00
CLEANING AND SURFACE COATINGS	COATINGS AND RELATED PROCESS SOLVENTS	0.38	0.36	0.00	0.00	0.00
CLEANING AND SURFACE COATINGS	PRINTING	0.03	0.03	0.00	0.00	0.00
CLEANING AND SURFACE COATINGS	ADHESIVES AND SEALANTS	0.05	0.04	0.00	0.00	0.00
CLEANING AND SURFACE COATINGS	OTHER (CLEANING AND SURFACE COATINGS)	0.00	0.00	0.00	0.00	0.00
PETROLEUM PRODUCTION AND MARKETING	OIL AND GAS PRODUCTION	0.71	0.40	0.00	0.01	0.00
PETROLEUM PRODUCTION AND MARKETING	PETROLEUM REFINING	0.00	0.00	0.00	0.00	0.00
PETROLEUM PRODUCTION AND MARKETING	PETROLEUM MARKETING	0.17	0.17	0.00	0.00	0.00
PETROLEUM PRODUCTION AND MARKETING	OTHER (PETROLEUM PRODUCTION AND MARKETING)	0.14	0.12	0.00	0.00	0.00
CHEMICAL	FOOD AND AGRICULTURE	1.16	0.94	0.00	0.00	1.76
CHEMICAL	MINERAL PROCESSES	0.00	0.00	0.00	0.00	0.13
CHEMICAL	METAL PROCESSES	0.00	0.00	0.00	0.00	0.00
CHEMICAL	WOOD AND PAPER	0.00	0.00	0.00	0.00	0.01
CHEMICAL	GLASS AND RELATED PRODUCTS	0.00	0.00	0.00	0.00	0.00
CHEMICAL	ELECTRONICS	0.00	0.00	0.00	0.00	0.00
INDUSTRIAL PROCESSES	OTHER (INDUSTRIAL PROCESSES)	1.19	1.00	0.00	0.00	0.00
INDUSTRIAL PROCESSES	CONSUMER PRODUCTS	0.45	0.43	0.00	0.00	0.00
INDUSTRIAL PROCESSES	ARCHITECTURAL COATINGS AND RELATED PROCESS SOLVENTS	2.20	2.20	0.00	0.00	0.00
INDUSTRIAL PROCESSES	PESTICIDES/FERTILIZERS	0.08	0.07	0.00	0.00	0.00
INDUSTRIAL PROCESSES	ASPHALT PAVING / ROOFING	0.00	0.00	0.00	0.00	0.00
INDUSTRIAL PROCESSES	REFRIGERANTS	0.00	0.00	0.00	0.00	0.00
INDUSTRIAL PROCESSES	OTHER (SOLVENT EVAPORATION)	0.31	0.13	1.75	0.09	0.29
INDUSTRIAL PROCESSES	RESIDENTIAL FUEL COMBUSTION	93.93	7.51	0.00	0.00	27.84
INDUSTRIAL PROCESSES	FARMING OPERATIONS	0.00	0.00	0.00	0.00	12.66
INDUSTRIAL PROCESSES	CONSTRUCTION AND DEMOLITION	0.00	0.00	0.00	0.00	0.91
SOLVENT EVAPORATION	PAVED ROAD DUST	0.00	0.00	0.00	0.00	4.26
SOLVENT EVAPORATION	UNPAVED ROAD DUST	0.00	0.00	0.00	0.00	12.85
SOLVENT EVAPORATION	FUGITIVE WINDBLOWN DUST	0.00	0.00	0.00	0.00	7.91
SOLVENT EVAPORATION	FIRE	0.01	0.00	0.05	0.00	0.01
MISCELLANEOUS PROCESSES	WASTE BURNING AND DISPOSAL	3.09	1.76	19.67	0.18	2.86
MISCELLANEOUS PROCESSES	UTILITY EQUIPMENT	0.00	0.00	0.00	0.00	0.00
MISCELLANEOUS PROCESSES	COOKING	0.02	0.02	0.00	0.00	0.07

**1998 EMISSION INVENTORY FOR KINGS COUNTY**

CATEGORY	SUBCATEGORY	EMISSIONS (TONS PER DAY)				PM	PM10
		TOG	ROG	CO	NOX	SOX	PM
MISCELLANEOUS PROCESSES	OTHER (MISCELLANEOUS PROCESSES)	0.00	0.00	0.00	0.00	0.00	0.00
ON-ROAD MOTOR VEHICLES	LIGHT DUTY PASSENGER (LDA)	3.71	3.37	29.09	2.37	0.03	0.08
ON-ROAD MOTOR VEHICLES	LIGHT AND MEDIUM DUTY TRUCKS	0.00	0.00	0.00	0.00	0.00	0.00
ON-ROAD MOTOR VEHICLES	LIGHT DUTY TRUCKS - 1 (LDT1)	1.25	1.14	12.30	0.88	0.01	0.02
ON-ROAD MOTOR VEHICLES	LIGHT DUTY TRUCKS - 2 (LDT2)	0.94	0.83	9.56	1.22	0.01	0.05
ON-ROAD MOTOR VEHICLES	MEDIUM DUTY TRUCKS (MDV)	0.97	0.87	9.98	0.92	0.01	0.03
ON-ROAD MOTOR VEHICLES	HEAVY DUTY GAS TRUCKS (ALL)	0.00	0.00	0.00	0.00	0.00	0.00
ON-ROAD MOTOR VEHICLES	HEAVY DUTY GAS TRUCKS - 1 (LHDV1)	0.55	0.50	8.39	0.38	0.00	0.00
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY GAS TRUCKS - 2 (LHDV2)	0.02	0.02	0.27	0.04	0.00	0.00
ON-ROAD MOTOR VEHICLES	MEDIUM HEAVY DUTY GAS TRUCKS (MHDV)	0.40	0.36	7.02	0.23	0.00	0.00
ON-ROAD MOTOR VEHICLES	HEAVY HEAVY DUTY GAS TRUCKS (HHDV)	0.18	0.16	3.31	0.08	0.00	0.00
ON-ROAD MOTOR VEHICLES	HEAVY DUTY DIESEL TRUCKS (ALL)	0.00	0.00	0.00	0.00	0.00	0.00
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY DIESEL TRUCKS - 1 (LHDV1)	0.00	0.00	0.01	0.06	0.00	0.00
ON-ROAD MOTOR VEHICLES	LIGHT HEAVY DUTY DIESEL TRUCKS - 2 (LHDV2)	0.04	0.03	0.22	0.62	0.02	0.03
ON-ROAD MOTOR VEHICLES	MEDIUM HEAVY DUTY DIESEL TRUCKS (MHDV)	0.26	0.23	1.11	2.25	0.07	0.11
ON-ROAD MOTOR VEHICLES	HEAVY HEAVY DUTY DIESEL TRUCKS (HHDV)	0.08	0.08	0.34	0.01	0.00	0.00
ON-ROAD MOTOR VEHICLES	MOTORCYCLES (MCY)	0.01	0.01	0.03	0.11	0.00	0.00
ON-ROAD MOTOR VEHICLES	HEAVY DUTY DIESEL URBAN BUSES (UB)	0.00	0.00	0.10	0.00	0.00	0.00
ON-ROAD MOTOR VEHICLES	HEAVY DUTY GAS URBAN BUSES (UB)	0.02	0.02	0.50	0.10	0.00	0.00
ON-ROAD MOTOR VEHICLES	SCHOOL BUSES (SB)	0.03	0.02	0.46	0.06	0.00	0.00
ON-ROAD MOTOR VEHICLES	MOTOR HOMES (MH)	0.00	0.00	0.00	0.00	0.00	0.00
ON-ROAD MOTOR VEHICLES	OTHER (ON-ROAD MOTOR VEHICLES)	3.84	3.42	7.88	0.96	0.00	0.21
ON-ROAD MOTOR VEHICLES	AIRCRAFT	0.01	0.01	0.03	0.23	0.00	0.00
ON-ROAD MOTOR VEHICLES	TRAINS	0.00	0.00	0.00	0.00	0.00	0.00
ON-ROAD MOTOR VEHICLES	SHIPS AND COMMERCIAL BOATS	0.05	0.05	0.16	0.00	0.00	0.00
ON-ROAD MOTOR VEHICLES	RECREATIONAL BOATS	0.12	0.11	0.68	0.01	0.00	0.00
ON-ROAD MOTOR VEHICLES	OFF-ROAD RECREATIONAL VEHICLES	0.35	0.30	3.34	0.90	0.09	0.06
ON-ROAD MOTOR VEHICLES	OFF-ROAD EQUIPMENT	0.55	0.49	3.28	3.68	0.44	0.23
ON-ROAD MOTOR VEHICLES	FARM EQUIPMENT	0.00	0.00	0.00	0.00	0.00	0.00
ON-ROAD MOTOR VEHICLES	FUEL STORAGE AND HANDLING	0.00	0.00	0.00	0.00	0.00	0.00
ON-ROAD MOTOR VEHICLES	OTHER (OTHER MOBILE SOURCES)	0.01	0.01	0.00	0.00	0.00	0.00
ON-ROAD MOTOR VEHICLES	GEOGENIC SOURCES	0.00	0.00	0.00	0.00	0.00	0.00
ON-ROAD MOTOR VEHICLES	WILDFIRES	0.00	0.00	0.00	0.00	0.00	0.00
ON-ROAD MOTOR VEHICLES	WINDBLOWN DUST	0.00	0.00	0.00	0.00	0.00	0.00
ON-ROAD MOTOR VEHICLES	OTHER (NATURAL SOURCES)	120.34	28.79	121.83	26.89	1.46	70.67
ALL SOURCES							
	PM10 - FUEL COMBUSTION						0.74
	PM10 - MOBILE SOURCES						0.82
	PM10 - ALL SOURCES						36.61